

WHAT IS CLAIMED IS:

1. A coaxial via hole used in a carrier, comprising:

an outer cylinder-shaped conductor extending along a first direction;

an inner cylinder-shaped conductor in the outer cylinder-shaped

5 conductor, wherein the inner cylinder-shaped conductor extends along the first direction; and

an insulating fill between the outer cylinder-shaped conductor and the inner cylinder-shaped conductor.

2. The coaxial via hole as claimed in claim 1, wherein the first direction

10 is vertical to a direction along which the carrier extends.

3. The coaxial via hole as claimed in claim 1, wherein the carrier is a printed circuit board (PCB).

4. The coaxial via hole as claimed in claim 1, wherein the carrier is a substrate.

15 5. The coaxial via hole as claimed in claim 1, wherein the carrier is an Integrated Circuit (IC) socket.

6. The coaxial via hole as claimed in claim 1, wherein the carrier is an adapter.

7. The coaxial via hole as claimed in claim 1, wherein the carrier is a connector.

8. The coaxial via hole as claimed in claim 1, wherein the carrier is a heat sink.

5 9. The coaxial via hole as claimed in claim 1, wherein the carrier at least comprises a conductive layer and the coaxial via hole penetrates a portion of the carrier.

10 10. The coaxial via hole as claimed in claim 1, wherein the carrier at least comprises a conductive layer and the coaxial via hole penetrates the 10 carrier.

11. The coaxial via hole as claimed in claim 1, wherein a cross section, in a direction vertical to the first direction, of the outer cylinder-shaped conductor can shape as any configuration and wherein a cross section, in the direction vertical to the first direction, of the inner cylinder-shaped conductor 15 can shape as any configuration.

12. The coaxial via hole as claimed in claim 1, the inner cylinder-shaped conductor is connected to a negative voltage source.

13. The coaxial via hole as claimed in claim 1, the inner cylinder-shaped conductor is connected to a positive voltage source.

14. The coaxial via hole as claimed in claim 1, the inner cylinder-shaped conductor is connected to a signal conductor.
15. The coaxial via hole as claimed in claim 1, the outer cylinder-shaped conductor is connected to a negative voltage source.
- 5 16. The coaxial via hole as claimed in claim 1, the outer cylinder-shaped conductor is connected to a positive voltage source.
17. The coaxial via hole as claimed in claim 1, the outer cylinder-shaped conductor is connected to a signal conductor.
18. The coaxial via hole as claimed in claim 1, further comprising:
- 10 a conductor which is connected to the inner cylinder-shaped conductor and is connected to a negative voltage source.
19. The coaxial via hole as claimed in claim 1, further comprising:
- a conductor which is connected to the inner cylinder-shaped conductor and is connected to a positive voltage source.
- 15 20. The coaxial via hole as claimed in claim 1, further comprising:
- a conductor which is connected to the inner cylinder-shaped conductor and is connected to a signal conductor.

21. The coaxial via hole as claimed in claim 1, further comprising

a conductor which is connected to the outer cylinder-shaped conductor
and is connected to a negative voltage source.

22. The coaxial via hole as claimed in claim 1, further comprising

5 a conductor which is connected to the outer cylinder-shaped conductor
and is connected to a positive voltage source.

23. The coaxial via hole as claimed in claim 1, further comprising

a conductor which is connected to the outer cylinder-shaped conductor
and is connected to a signal conductor.

10 24. The coaxial via hole as claimed in claim 1, wherein the insulating fill

is made of a material with high dielectric constant.

25. A method of manufacturing a coaxial via hole, comprising:

(a) forming a first hole in a carrier;

(b) making the interior of the first hole conduct electricity to form an
15 outer cylinder-shaped conductor;

(c) placing an insulating material in the outer cylinder-shaped conductor
to form an insulating fill;

- (d) forming a second hole in the insulating fill, wherein the second hole has a diameter smaller than the diameter of the first hole; and
- (e) making the interior of the second hole conduct electricity to form an inner cylinder-shaped conductor.

5 26. The method of manufacturing a coaxial via hole as claimed in claim 25, wherein in said step (b), making the interior of the first hole become conduct electricity to form an outer cylinder-shaped conductor by plating.

10 27. The method of manufacturing a coaxial via hole as claimed in claim 25 or 26, wherein in said step (e), making the interior of the second hole become conduct electricity to form an inner cylinder-shaped conductor by plating.

15 28. The method of manufacturing a coaxial via hole as claimed in claim 25 or 26, wherein in said step (e), making the interior of the second hole become conduct electricity to form an inner cylinder-shaped conductor by placing conductive paste.

29. The method of manufacturing a coaxial via hole as claimed in claim 25, wherein in said step (c), the insulating material is filled in the outer cylinder-shaped conductor by plugging.

20 30. The method of manufacturing a coaxial via hole as claimed in claim 25, wherein in said step (c), the insulating material is filled in the outer

cylinder-shaped conductor by laminating.

31. A coaxial via hole used in a carrier, comprising:

an outer cylinder-shaped conductor extending along a first direction;

an inner cylinder-shaped conductor in the outer cylinder-shaped

5 conductor, wherein the inner cylinder-shaped conductor extends along the first direction; and

an electrical-resistant fill between the outer cylinder-shaped conductor and the inner cylinder-shaped conductor.

32. The coaxial via hole as claimed in claim 31, further comprising:

10 a conductor which is connected to the outer cylinder-shaped conductor and is connected to a signal conductor.

33. The coaxial via hole as claimed in claim 31, further comprising:

a conductor which is connected to the outer cylinder-shaped conductor and is connected to positive voltage source.

15 34. The coaxial via hole as claimed in claim 31, further comprising:

a conductor which is connected to the outer cylinder-shaped conductor and is connected to a negative source.

35. The coaxial via hole as claimed in claim 31, further comprising:

a conductor which is connected to the inner cylinder-shaped conductor and is connected to a signal conductor.

36. The coaxial via hole as claimed in claim 31, further comprising:

5 a conductor which is connected to the inner cylinder-shaped conductor and is connected to a positive voltage source.

37. The coaxial via hole as claimed in claim 31, further comprising:

a conductor which is connected to the inner cylinder-shaped conductor and is connected to a negative voltage source.

10 38. The coaxial via hole as claimed in claim 31, wherein the carrier is a PCB.

39. The coaxial via hole as claimed in claim 31, wherein the carrier is a substrate.

15 40. The coaxial via hole as claimed in claim 31, wherein the carrier is an IC socket.

41. The coaxial via hole as claimed in claim 31, wherein the carrier is an adapter.

42. The coaxial via hole as claimed in claim 31, wherein the carrier is a connector.

43. The coaxial via hole as claimed in claim 31, wherein the carrier is a heat sink.

5 44. The coaxial via hole as claimed in claim 31, wherein the first direction is vertical to a direction along which the carrier extends.

45. The coaxial via hole as claimed in claim 31, wherein the carrier at least comprises a conductive layer and the coaxial via hole penetrates a portion of the carrier.

10 46. The coaxial via hole as claimed in claim 31, wherein the carrier at least comprises a conductive layer and the coaxial via hole penetrates the carrier.

47. A method of manufacturing a coaxial via hole, comprising:

- (a) forming a first hole in a carrier;
- 15 (b) making the interior of the first hole become conduct electricity to form an outer cylinder-shaped conductor;
- (c) placing an electrical-resistant material in the outer cylinder-shaped conductor to form an electrical-resistant fill;

- (d) forming a second hole in the electrical-resistant region, wherein the second hole has a diameter smaller than the diameter of the first hole; and
- (e) making the interior of the second hole become conduct electricity to form an inner cylinder-shaped conductor.

5 48. The method of manufacturing a coaxial via hole as claimed in claim 47, wherein in said step (b), making the interior of the first hole become conduct electricity to form an outer cylinder-shaped conductor by plating.

10 49. The method of manufacturing a coaxial via hole as claimed in claim 47 or 48, wherein in said step (e), making the interior of the second hole become conduct electricity to form an inner cylinder-shaped conductor by plating.

15 50. The method of manufacturing a coaxial via hole as claimed in claim 47 or 48, wherein in said step (e), making the interior of the second hole become conduct electricity to form an inner cylinder-shaped conductor by placing conductive paste.

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